Amendments To The Drawings

The Examiner objects to the drawings under 37 CFR 1.83(a). Specifically, The Examiner states that the drawings must show every feature of the invention specified in the claims. Therefore, the Examiner finds that the "means for generating gamut conversion values, said values calculated by traversing the edges of a plurality of gamuts ...", as recited in Claims 5, 13 as well as similar language in Claims 7 and 15 must be shown of the features canceled from the claims. The Examiner admonishes that no new matter should be entered.

Without further traversing the present objection, Applicant herein submits amended Figures 2B and 2C and has added some accompanying text to the specification at paragraph [028] to show some examples of traversing the edges of gamuts. As this amended text and figures merely expounds on what was already stated in the specification for traversing edges and that traversing gamut edges are well known in the art, Applicant does not add any new matter to meet the present objection to the figures.

The attached sheet of drawings includes changes to Fig. 2B and Fig. 2C. This sheet, which includes Fig. 1-2C, replaces the original sheet including Fig. 1-2C. In Fig. 2B, previously omitted elements 202, 204, 206, 208 and 210 have been added. In Fig. 2C, previously omitted elements 204, 208, and 210 have been added.

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REMARKS

The following remarks are responsive to the Office Action mailed on June 13, 2005.

Claims 1-32 were originally filed in the application. Claims 21-32 were withdrawn pursuant an earlier restriction requirement. Thus, Claims 1-20 are currently pending in the present application.

Claim Rejection under 35 USC § 112:

Claims 1-12 and 17:

The Examiner has rejected Claims 1-12 and 17 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular, as to Claim 1 at line 7, the Examiner finds that the limitation "calculate hue angles for said image data based on received components" is not clear as to whether these "components" refer to the chroma components for the luma components as set forth in line 5.

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As to Claim 1, line 8, the Examiner finds that it is not clear what exactly "a gamut conversion unit to derive gamut conversion values". The Examiner asks "does the Applicant mean 'a gamut conversion for deriving gamut conversion value' or 'a gamut conversion unit derives gamut conversions values'"?

As to Claim 1, lines 2, 3, 4 and 6, the Examiner asks the same question as to 'input channel means to receives'; 'a gamut unit to convert'; 'a chroma/luma unit to convert' and 'a hue angle calculator to receive'.

As to Claim 1, line 8, the Examiner finds that 'a gamut conversion values to apply to the components of said source image' is not clear as to whether these 'components' refer to the chroma components for the luma components as set forth in line 5.

Claims 2-12 are rejected as being ultimately dependant upon Claim 1.

As to Claim 17, line 4, the Examiner finds that it is not clear what exactly is the claimed "and converts the color is converted back to chroma/luma".

With respect to the rejections under 35 USC 112, Applicant respectfully submits that the current amendments to the Claims have overcome the present rejections.

Claims 4 and 13-20:

The Examiner rejects Claims 4 and 13-20 under 35 USC 112, first paragraph, as failing to comply with the enablement requirement. The Examiner finds that the Claims contain subject matter which was not described in the specification in such a way as to

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enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, as to Claim 4, the Examiner finds that it is not clear what exactly the 'values that are computed off-line".

As to Claim 13, the Examiner finds that Claim 13 recites, solely, a 'single means' as its function and as being of undue breadth. In other words, a single means claim, which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor. Furthermore, the Examiner finds, the specification fails to provide a clear description of the claimed limitation 'said values calculated by traversing the edges of a plurality of gamuts that said unit is to apply conversion'.

As to Claim 15, the Examiner finds that it is not clear what is 'traversing around the edge of a gamut to generate saturation values'.

As for the present rejection to Claims 4, 13-20, Applicant respectfully avers that the present amendment to the Claims overcomes the present rejection.

Claim Rejection under 35 USC 102:

The Examiner rejects Claim 13 under 35 USC 102(b) as being anticipated by Narahara (USP 6,023,527).

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Specifically, the Examiner finds that Narahara discloses (Figs 3, 5, and 8) a gamut conversion unit comprising:

means (5, 6, and7) for generating gamut conversion values, which are calculated by traversing the edges of a plurality of gamuts. Fig 8 shows the color gamut compressing or gamut conversion method, wherein the color gamuts of CRT traverse from the outer edges of the CRT into the inner edges of the inkjet.

Applicant avers that the present amendment to Claim 13 has now overcome the present rejection to Claim 13.

Claim Rejection under 35 USC 103:

Claims 14 and 15:

The Examiner rejects Claim 14 under 35 USC 103(a) as being unpatentable over Narahara in view of Qiao (USP 2003/01174457).

Specifically, with respect to Claim 14, the Examiner finds that Narahara discloses (Figs. 1 and 8) the monitor gamuts (CRT) and the multi-primary gamuts (printer and monitor gamuts). However, the Examiner finds that Narahara fails to disclose the standard gamuts.

The Examiner, however, finds that Qiao teaches that different types of gamuts from different devices such as a printer, monitor, scanner, or digital camera may have its own unique color gamut (Section 4).

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Therefore, the Examiner concludes, it would have been obvious to incorporate the teachings of a group compris[ing] a standard gamuts, monitor gamuts and multi-primary gamuts into the gamut conversion unit of Narahara since this is conventional in the art.

As to Claim 15, the Examiner finds that Narahara discloses (Fig. 8) the conversion values are calculated by traversing around the edge of the inkjet gamut. However, the Examiner finds that Narahara fails to explicitly teach the generation of saturation values.

The Examiner, however, avers that Narahara further teaches "the luminance of the color display is substantially maintained during the mapping process while the purity or chroma of the color display unit is adjusted to map onto the gamut of the inkjet printer". The Examiner finds that it is well known in the art that, based upon human perception, another set of terms in colorimetric includes dominant wavelength, excitation purity and luminance which roughly corresponds to hue, saturation, and lightness/brightness, respectively.

Therefore, the Examiner concludes, the "excitation purity" can be considered as the claimed color saturation.

As to Claims 14 and 15, Applicant respectfully avers that the present rejection is overcome by the amendment to Claim 13.

Claims 1-8, 10-12, 16 and 18-20:

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The Examiner rejects Claims 1-8, 10-12, 16 and 18-20 under 35 USC 103(a) as being unpatentable over Narahara as applied to Claim 13 above, and further in view of Qiao (US 1003/0117457) and Masuzaki (USP 5,987,165).

With respect to Claim 16, the Examiner finds that Qiao discloses (Figs. 6 and 7) generate one color in a perceptually uniform chroma/luma space for each hue angle. (See section 41, the last four lines and sections 42 and 43).

The Examiner states that Matsuzaki also discloses (Figs. 1 and 10) a hue calculation (307) in a perceptually uniform chroma/luma space (303).

Therefore, the Examiner concludes, it would have been obvious to use the hue angle calculation techniques of Qiao and Matsuzaki in the color gamut conversion unit of Narahara to adjust the hue angle when converting from one color space to another color space.

With respect to Claim 18, the Examiner finds that Matsuzaki discloses (Figs. 1-10) wherein the values are generated along the edges of the gamut (Fig. 10) and, for a set of points along the edge, chroma/luma and hue angle data is generated (Fig.1, luma (302), saturation (306) and hue (307) are calculated).

With respect to Claim 19, the Examiner finds that Qiao discloses (Figs. 6 and 7) generate one one color in a perceptually uniform chroma/luma space for each hue angle. (See section 41, the last four lines and sections 42 and 43).

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With respect to Claim 20, the Examiner finds that Narahara fails to teach using the saturation ratios to convert one color gamut space to another color gamut space. However, the Examiner concludes, the idea of using the saturation ratios in color gamut space conversion is conventional in the art.

With respect to Claim 1, as the Examiner understands it, the Examiner finds that Narahara discloses (Figs. 3, 5, and 8) a gamut conversion system comprising:

Input channel means (external interface I) (3) for receiving source image data (RGB);

A gamut unit (5) for converting the source image data (RGB) into perceptually uniform space data (LAB);

A chroma/luma unit (6) for converting the perceptually uniform space data (LAB) into a format comprising chroma and luma components (LCH); and

A gamut conversion unit (reproduction color space mapping unit 7) for deriving gamut conversion values.

However, the Examiner finds that Narahara fails to disclose a hue angle calculator for receiving at least the chroma components from the chroma/luma unit to calculate hue angles.

The Examiner finds, however, that Qiao discloses (Figs. 6 and 7) generate one color in a perceptually uniform chroma/luma space for each hue angle. (See section 41, the last four lines and sections 42 and 43). The Examiner further finds that Qiao teaches the conversion values can be stored in a look-up table (section 42).

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The Examiner also finds that Matsuzaki discloses (Figs. 1 and 10) a hue calculation (307) in a perceptually uniform chroma/luma space (303).

Therefore, the Examiner concludes, it would have been obvious to use the hue angle calculation techniques of Qiao and Matsuzaki in the color gamut conversion unit of Narahara to adjust the hue angle when converting from one color space to another color space.

Regarding Claim 2, the Examiner states that it is obvious that the chroma/luma conversions unit may not be needed since the input image data is already in the chroma/luma format.

Regarding Claim 3, the Examiner states that hue angles in some power of two is conventional in the art.

Regarding Claim 4, the Examiner states that Narahara discloses (Fig. 10) that the color values are computed off-line.

Regarding Claim 5, the Examiner states that Narahara (as best understood by the Examiner) discloses (Figs. 3, 5, and 8) a gamut conversion unit comprising:

means (5, 6 and 7) for generating gamut conversion values, which are calculated by traversing the edges of a plurality of gamuts. The Examiner finds that Fig. 8 shows the color gamut compression or gamut conversion method, wherein the color gamuts of CRT traverse from the outer edges of the CRT into the inner edges of the inkjet.

Regarding Claims 6-8 and 10-12, the Examiner states please note the rejections as set forth above with regards to claims 14-16 and 18-20, respectively.

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As for Claims 1-8, 10-12, 16 and 18-20 – and without taking exception with all of the points mentioned by the Examiner – the Applicant respectfully avers that the present rejections to these Claims are overcome by the amendments to independent Claims 1 and 13.

Applicant reserves all future arguments to all of the other points raised by the Examiner in regards to the dependent Claims. For merely one example, Applicant may require additional evidence by the Examiner with regards to statements of obviousness based on stated "conventional in the art" arguments – e.g. as employed by the Examiner in rejecting Claim 20.

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Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully submits that all pending Claims are patentable over the cited art of record and are in condition for allowance. Therefore, Applicant requests the Examiner to reconsider and withdraw the outstanding rejection and pass this application to allowance.

If the Examiner believes a telephone conference would expedite the allowance of the claims, the Examiner is invited to contact Stuart P. Kaler at (707) 824-2487.

Respectfully submitted,

Dated: 13 Dec 2005

By: Stuart P. Kaler
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Annotated Sheet Showing Changes

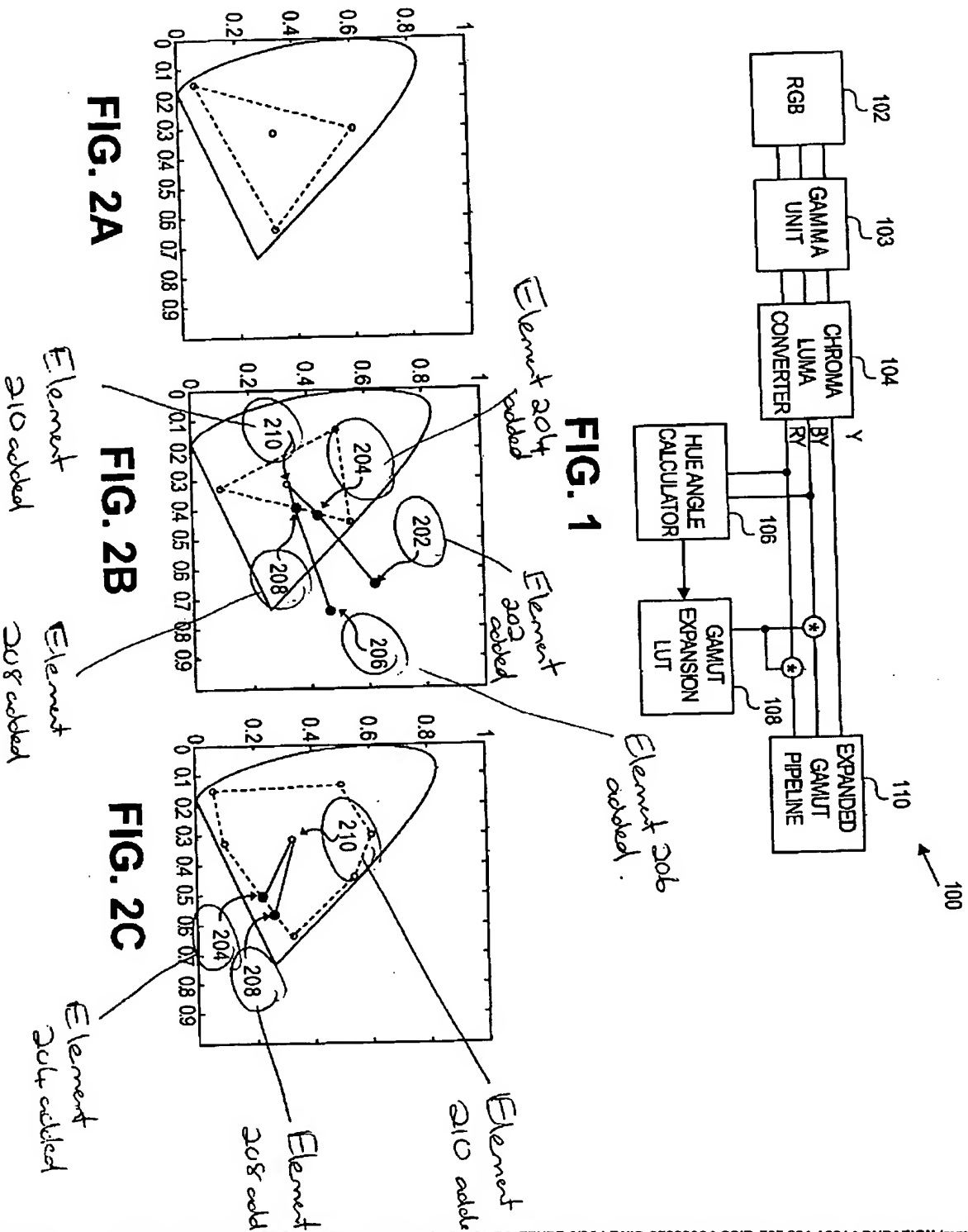

FIG. 1

FIG. 2A

FIG. 2B

FIG. 2C